

LISTING OF THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method of catalyzing an enantioselective oxidation reaction of an oxidizable, chiral organic compound composed of a racemic mixture of a first enantiomer and a second enantiomer, comprising:
 - a) contacting the organic compound with:
 - i) an oxidizing agent, and
 - ii) a catalyst comprising a metal palladium composition and a selected enantiomer of a chiral ligand, wherein the metal is selected from the group consisting of Group 8, Group 9 and Group 10 of the Periodic Table of the Elements and the chiral ligand comprises at least one chiral atom and containing two or more tertiary amines nitrogen atoms that are separated by two or more linking atoms; and, thereby
 - b) producing an oxidized organic compound and a single selectively oxidizing the first enantiomer of the organic compound so as to produce (i) an oxidized organic compound and (ii) a mixture of the first and second enantiomers in which the second enantiomer represents at least 50% of the mixture.
2. (original) The method of Claim 1 wherein the organic compound is selected from the group consisting of alcohols, thiols, amines and phosphines.
3. (original) The method of Claim 1 wherein the oxidizing agent is selected from the group consisting of molecular oxygen, benzoquinone, Cu (I) salts, and Cu (II) salts.
4. (original) The method of Claim 3 wherein the oxidizing agent is molecular oxygen.
5. (original) The method of Claim 1 wherein the oxidizing agent is used in a stoichiometric amount.

6. (currently amended) The method of Claim 1 ~~which is wherein said contacting is~~ conducted in an organic solvent selected from the group consisting of toluene, *tert*-amyl alcohol, water, CHCl₃, methylene chloride, 1,2-dichloroethane, and benzene.

7. (canceled)

8. (currently amended) The method of Claim 7 ~~1~~ wherein the ~~metal palladium~~ composition is a palladium (II) complex.

9. (original) The method of Claim 8 wherein the palladium (II) complex is selected from the group consisting of Pd(OAc)₂, Pd₂(dibenzylideneacetone)₃, PdCl₂, Pd(CH₃CN₂)Cl₂, Pd(PhCN₂)Cl₂, [(allyl)PdCl]₂, PdCl₂ (cyclooctadiene), Pd(OCOCF₃), and Pd(norbornadiene)Cl₂.

10. (canceled)

11. (canceled)

12. (currently amended) The method of Claim 11 ~~1~~ where the ~~percentage of second~~ enantiomer is greater than ~~represents at least~~ 60% ~~of the mixture~~.

13. (currently amended) The method of Claim 12 where the ~~percentage of second~~ enantiomer is greater than ~~represents at least~~ 90% ~~of the mixture~~.

14. (canceled)

15. (canceled)

16. (canceled)

17. (currently amended) The method of Claim 16 1 wherein the organic compound is a chiral secondary alcohol.

18. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is an enantioselective Wacker-type cyclization reaction.

19. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is an enantioselective aromatic oxidation reaction.

20. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is the enantio-group differentiation of meso diols.

21. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is an enantioselective oxidative [4+2] cycloaddition reaction.

22. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is a C-C bond forming cyclization reaction.

23. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is a cyclization reaction.

24. (withdrawn) The method of Claim 23 wherein the organic compound contains an olefin tethered to a nucleophilic atom.

25. (canceled)

26. (canceled)

27. (canceled)

28. (canceled)

29. (canceled)

30. (canceled)

31. (canceled)

32. (canceled)

33. (canceled)

34. (canceled)

35. (canceled)

36. (canceled)

37. (canceled)

38. (canceled)

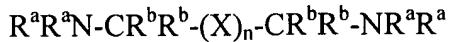
39. (canceled)

40. (canceled)

41. (canceled)

42. (canceled)

43. (currently amended) The method of Claim 1 wherein the chiral ligand has the structure[[:]]



wherein:

each R^a -group is independently selected from the group consisting of alkyl, cycloalkyl, cycloheteroalkyl, aryl, heteroaryl and silyl;

X is $-CR^b R^b-$ or a heteroatom;

n is an integer from 0-2; and

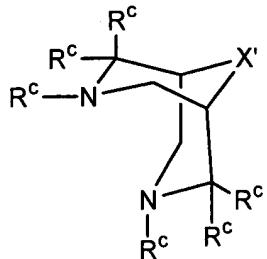
each R^b -group is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, cycloheteroalkyl, aryl, heteroaryl and silyl; and,

wherein two or more of the R^a and R^b groups, together with the atoms to which they are attached, can be taken together to form one or more cyclic structures.

44. (previously presented) The method of Claim 43 wherein n is 1 or 2.

45. (currently amended) The method of Claim 43 wherein ~~two or more of the R^a and R^b groups, together with the atoms to which they are attached, are taken together to form a four ring structure the chiral ligand is tetracyclic.~~

46. (currently amended) The method of Claim 1 wherein the chiral ligand has the structure[[:]]



wherein: each R^c -group is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, cycloheteroalkyl, aryl, heteroaryl and silyl, with the proviso that the R^c substituents bound to the nitrogen atoms are other than hydrogen; and X' is selected from the group

consisting of -O-, -S-, -N(R^d)-, -C(R^d)₂-, -C(O)-, C(NR^d)-, C(OR^d)₂-, and C(SR^d)₂-; and in which each R^d group is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, cycloheteroalkyl, aryl, heteroaryl and silyl; and, wherein two or more of the R^c and R^d groups, together with the atoms to which they are attached, can be taken together to form one or more cyclic structures.

47. (currently amended) The method of Claim 46 wherein X' is ~~CR^dR^d is -C(R^d)₂-~~, and two or more of the R^e and R^d groups, together with the atoms to which they are attached, are taken together to form a four-ring structure.

48. (new) The method of claim 43 wherein R^a and R^b are independently selected from the group consisting of branched, unbranched, and cyclic C₁-C₂₄ alkyl optionally substituted with at least one substituent.

49. (new) The method of Claim 48, wherein the at least one substituent is selected from hydroxyl, cyano, alkoxy, =O, =S, nitro, halogen, haloalkyl, heteroalkyl, amino, and sulphydryl.

50. (new) The method of Claim 48 wherein R^a and R^b are independently selected from the group consisting of branched, unbranched, and cyclic C₁-C₆ alkyl optionally substituted with at least one substituent.

51. (new) The method of Claim 50 wherein the at least one substituent is selected from hydroxyl, cyano, alkoxy, =O, =S, nitro, halogen, haloalkyl, heteroalkyl, amino, and sulphydryl.

52. (new) The method of Claim 1 wherein the chiral ligand is (-)-sparteine.